Younghun Chae

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RESEARCH INTERESTS

network; network security; distributed system; wireless network; wireless sensor network; intrusion; operating systems; database

SKILLS

Languages: C, C++, C#, NesC, Java, Python, Matlab, Maple, R
Operating Systems: Windows, {Redhat, Debian} Linux
Database: MySQL

EDUCATION

University of Rhode Island   **Kingston, RI**
Ph.D. of Science in Computer Science   2012 - 2017
  • Ph.D.'s dissertation on Representing Statistical Analysis by using Trust, May, 2017

Master of Science in Computer Science   2009 - 2012
  • Master's thesis on Trust based Secure Routing Protocols, May, 2012

University of Suwon   **Hwaseong-city, Kyeonggi-do, Republic of Korea**
Bachelor of Science in Computer Science   2000 - 2007
  • Graduate project: Implementation of Portable DivX Player based on Sigmadesign EM8622L Chipset.

RESEARCH EXPERIENCE

University of Rhode Island   **Kingston, RI**
Research Assistant at the department of Computer Science and Statistics   Oct.2010 – Dec.2017
  • Project **Representing Statistical Analysis with Trust** aims at representing statistical results with trust to provide intuitive, flexible interpretation, and efficient integration method. Supported Dr. Lisa DiPippo, Dr. Natallia Katenka, and Adaptive Methods Corporation (http://adaptivemethods.com) in analyzing network flows, developing representation methods.

  • Project **Secure Adaptive Routing Protocol** aimed at developing a secure routing protocol in Wireless Sensor Networks based on Trust evaluation, which can be adaptive to other architecture. Supported Dr. Lisa DiPippo, Dr. Yan Sun, and mZeal Corporation (http://www.mzeal.com) in developing TinyOS applications for TinyOS Simulator (TOSSIM) and TelosB. Developed Trust monitoring application, which can display trust values, overall throughputs, and transaction routes on graphs, for testing newly suggested protocol schemes. Expect that this research will contribute to perform high throughput rate with lesser hop counts.

University of Suwon   **Republic of Korea**
Research Assistant at Real-Time Embedded Database (RTEMD) Laboratory   Nov.2008 - Feb.2009
- Project **Real-time Object Tracking Systems** based on Wireless Sensor Networks aimed to developing a software to track people in a secured area. Suggested and tested schemes. One of the considered schemes was the object tracking system using vibration sensor on the floor.

Research Assistant of Association of Academic-industrial at RTEMD   Mar.2003 – Nov.2006
- Project **DivX Player** aimed at developing a portable DivX Player. This device can play movies at any places where have Television or Monitor. Modifying an application, which is provided by Sigmadesign, fit to Korea with displaying Korean characters. Produced Korean-Japanese-Chinese fonts and displayed the fonts with own developed two bytes indexing algorithm. Improved the image processing from poor quality display to high quality display. Made an image rotation algorithm. Added "Play in play" function, which allows displaying images while music is playing.

- Project **Microwindows Mobile Platform** aimed at developing a cheap mobile platform with good performance and easy development of application. This project started for low price mobile phone to export to Brazil. Microwindows (Nano-X windows) shows faster performance than Java based platform, which is popular in Korea, because of the binary file execution. Developed Hardware Access Layer (HAL) for emulator and hardware.

- Project **Lego Robot control** aimed at studying and understanding Real-Time Operating System Scheduling. This project used RT-Linux (http://www.fsmlabs.com) for controlling Lego Robot. Supported Master candidate student with writing source codes and fabricating the Logo robot.

- Project **E-Frame** aimed at developing an Electronic Frame. Since people use digital camera they can store and display on this device. Developed user interface.

PROFESSIONAL EXPERIENCE

Department of Computer Science, Walsh University   **North Canton, OH**
Course Development Consultant   Jun.2016 – Aug.2016
- Consulted on new courses for the Department of Computer Science at the Walsh University.
- Discrete Patterns for Computer Science, Database Techniques, Software Engineering, Programming in .Net, Linux/Unix Programming, and Operating Systems

Department of Computer Science and Statistics, University of Rhode Island   **Kingston, RI**
Summer Computer Camp Assistant   Jul. – Aug. 2013, 2014
- Guided and assisted summer computer camp students (8 – 10 years old)
- Assisted the summer camp designer

Ceyon Technology Corporation (http://www.ceyon.co.kr)   **Republic of Korea**
Software Developer   Dec.2006 - Nov.2007
- Project **Location Base System** aimed at indicating the real time location of target using Ubiquitous Sensor Network (USN). As an association of Academic-industrial project progressed with Chungbuk National University (http://chungbuk.ac.kr). Provided test software for developing hardware, such as packet control and device check. Developed demonstration software for exhibition using the results.

- Project **Agricultural products management** aimed at developing a system of produce, storage and transport agricultural products. Association of the national task progressed four companies together, Dongbu CNI (http://www.dongbucni.co.kr), Ezfarm (http://www.ezfarm.co.kr), TmaxSoft (http://www.tmaxsoft.com), and Ceyon Technology. Developed middleware of Radio Frequency Identification (RFID) to read and write RFID tags and the RFID tag issue software is developed with Zebra RFID printer.

• Project **Item Management** aimed at developing an item management system using RFID. Developed RFID read and write software for JUNO7, which is a WindowsCE based handheld RFID reader/writer, item management software and RFID tag issue software with Zebra RFID printer.

• Project **SD Type RFID Reader** aimed at developing a SD Card type RFID Reader. Expect that this device will provide usability at a variety of environments which have SD Card slot, such as PDAs or Laptops. Proceed as a project leader, supported hardware developers with device test software, such as automatic firmware updater, read/write test, and device status checker. Developed demonstration software for sales, exhibitions and certification.

• Project **Handheld RFID Reader JUNO7** aimed at developing a portable and light weight RFID Reader. Expect that this device will read/write RFID tags while the users are moving. Supported hardware developers with device test software, such as button test, RFID read and write test, beep test, wireless LAN test, and developing energy efficient read/write scheme. Developed demonstration software for sales, exhibitions and certification.

• Project **Entrance and exit management** aimed at developing a system for workers at a construction company. There are many works following many construction fields and they have to be managed by entrance time and exit time because of wages. They are all in a database of the head office; however, they were managed by the construction fields and the problem is that this system takes several steps. Entrance and exit management system solved this problem by RFID. They all have RFID tags and they use these tags when they enter and out their working fields. The RFID readers send the time data to the main database directly. My company associated with the head office and we provided the RFID readers, tags and the solutions.

University of Suwon   **Republic of Korea**
Server Administrator at RTEMD   June.2004 - Nov.2006
• Managed Microsoft Windows Server 2003 for RTEMD web server. Managed same server for file server, FTP and Network Shared Folder.

• Managed Redhat Linux 9.0 for RTEMD Wiki server. Managed same server for development server with Subversion (SVN).

TEACHING EXPERIENCE

Assistant Professor, Department of Computer Science, Kent State University at Stark   **North Canton, OH**
CS 33101: Structure of Programming Languages (Fall 2017, Fall 2018)   Aug.2017 – Present
• Introduction to syntax, semantics, behavior and implementation issues in imperative, functional, logic and object-oriented languages.
• Taught, guided the students and graded the assignments.

CS 33211: Operating Systems (Spring 2018)
•.Provides fundamental concepts of operating systems, such as process, memory, I/O management
• Taught, guided the students and graded the assignments.

CS 35101: Computer Architecture (Spring, Fall 2017 and 2018)
• Understand computer performance, computer design, and tradeoffs between cost and performance as well as between hardware and software.
• Taught, guided the students and graded the assignments.

CS 47205: Information Security (Spring 2018)
•.Provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents.
• Taught, guided the students and graded the assignments.

CS 47207: Digital Forensics (Fall 2017)
- •.Provides the foundation for understanding the key issues associated with data acquisition, digital forensics tools, recovery, documentation, and analysis of information contained within.
- • Taught, guided the students and graded the assignments.

CS 47221: Introduction to Cryptology (Fall 2017)
- •.Introduction to cryptography, classical cryptology, authentication, complexity issues, encryption standards, algebraic foundations, survey of existing cryptology protocols.
- • Taught, guided the students and graded the assignments.

COMT 36301: Advanced C++ Programming (Fall 2017)
- •.Introduction to the data abstraction, stream IO, inheritance, Standard Template Library, Microsoft foundation classes, system programming concepts.
- • Taught, guided the students and graded the assignments.

COMT 36320: Computer Forensics (Spring 2018)
- •. List common tools needed in forensic investigations, list best practices for forensic investigations, and perform forensic investigations using common tools.
- • Taught, guided the students and graded the assignments.

Full-time Lecturer, Department of Computer Science, Kent State University at Stark   **North Canton, OH**
CS 35101: Computer Architecture (Spring 2017)   Jan.2017 – May.2017
- • Understand computer performance, computer design, and tradeoffs between cost and performance as well as between hardware and software.
- • Taught, guided the students and graded the assignments.

COMT 36320: Computer Forensics (Spring 2017)
- • List common tools needed in forensic investigations, list best practices for forensic investigations, and perform forensic investigations using common tools.
- • Taught, guided the students and graded the assignments.

COMT 20021: C Sharp Programming (Spring 2017)
- • Introducing the C# application development landscape including variables, arrays, and controls in common use.
- • Taught, guided the students and graded the assignments.

Adjunct Professor, Department of Computer Technology, Kent State University at Stark   **North Canton, OH**
COMT 36301: Advanced C++ Programming (Fall 2016)   Aug.2016 – Dec.2016
- • Solve various problems using the C++ classes and Data abstraction, Stream IO, Inheritance, Standard Template Library (STL), Microsoft Foundation Classes, System programming concepts using United Modeling Language (UML)
- • Taught, guided the students and graded the assignments.

COMT 36309: Mobile Application Development (Fall 2016)
- • Introducing the mobile application development landscape including devices, platforms, tools, and languages in common use.
- • Taught, guided the students and graded the assignments.

Adjunct Professor, Department of Computer Science, Walsh University   **North Canton, OH**
CS 401A: Modular Projects (Fall 2016)   Aug.2016 – present
- • Develop modular projects with C programming language, and solve various problems using the concepts of structures
- • Taught, guided the students and graded the assignments.

Visiting Assistant Professor, Department of Computer Science, Walsh University   **North Canton, OH**
CS 201A: Visual Basic I (Fall 2015)   Aug.2015 – Dec.2015
- Develop Graphic User Interfaces (GUI) and add event-driven code to create and/or run simple applications from the Windows environment, using Visual Basic.
- Taught and guided the students and graded the assignments.

CS 221A: Database Techniques
- Developing and managing efficient and effective database applications requires understanding the fundamentals of database management systems, techniques for the design of database, and principles of database administration.
- Taught, guided the students and graded the assignments.

Teaching Assistant, Department of Computer Science   **Kingston, RI**
CSC 445: Models of Computation (Spring 2014)   Sep.2010 – May.2014
- Abstract models of computational systems. Classical models for uniprocessor, sequential, and store program computers.
- Graded the assignments and helped the students to solve the problems

CSC 436: Database Management Systems (Fall 2010, Fall 2011, Fall 2012, and Spring 2014)
- Data modeling, relational and object-oriented systems, main memory databases, query languages, query optimization, concurrency control, transaction management.
- Graded the assignments and helped the students to solve the problems

CSC 301: Fundamentals of Programming Languages (Summer 2013, Fall 2013, and Summer 2014)
- Organization of programming languages, data and control structures, syntax and semantics, compilers and interpreters.
- Graded the assignments and helped the students to solve the problems

CSC 485: Computer Forensics (Fall 2013)
- In-depth details about the Windows Operating Systems and the forensic artifacts available to the Forensic Examiner
- Graded the assignments and helped the students to solve the problems

CSC 200: Computer Problem Solving for Science and Engineering (Summer 2011, Summer 2012, and Summer 2013)
- Fundamental programming techniques in C++
- Graded the assignments and helped the students to solve the problems
- Online, 4 weeks

CSC 212: Data Structures and Abstractions (Spring 2013)
- Abstract data types and data structures in Java
- Graded the assignments
- Assisted the students in the Lab. Sections

CSC 412: Operating Systems and Networks (Spring 2011, Spring 2012, and Spring 2013)
- General concepts underlying operating systems. Process management, concurrency, scheduling, and memory management.
- Graded the assignments and helped the students to solve the problems

CSC 411: Computer Organization (Fall 2010, Fall 2011, and Fall 2012)
- Logical structure of computer systems, assembly language, computer architecture including digital logic, processor organization, instruction sets, virtual memory and microprogramming
- Graded the assignments and helped the students to solve the problems

CSC 110: Survey of Computer Science (Fall 2011)
- Broad introduction to computer science with an emphasis on problem solving
- Graded the assignments and helped the students to solve the problems

INTERNSHIPS

Korea Occupational Safety and Health Agency (http://www.kosha.or.kr)   **Republic of Korea**
Intern at the Department of Information Technology (IT)   Mar.2009 - June.2009
- Supported officers with modifying representative web-pages and answering customer requests about ITs.

- Supported Database Administrator (MySQL, Oracle 10g) with input data. Support Server Administrator (Oracle Solaris 8) with making management shell scripts.

AWARDS

European Alliance for Innovation (http://eai.eu)   **Belgium**
Student Travel Grant   2012

KT Corporation (http://www.kt.com)   **Republic of Korea**
KT IT-Master award   2006

University of Suwon   **Republic of Korea**
Academic Excellence Awards Level 2 from the department of Computer Science   Fall 2005, Spring and Fall 2006

Academic Excellence Awards Level 3 from the department of Computer Science   Spring 2005

Encouragement Awards from the department of Computer Science   Fall 2004

CERTIFICATION

Department of Computer Science, University of Rhode Island
- Digital Forensics & Cyber Security Certificate   May.2013

Human Resources Development Service of Korea
- Engineer Information Processing   Aug.2006

Korea Association for ICT promotion (http://www.ihd.or.kr)
- Linux Master Level 1 (highest level)   Dec.2005

PAPERS

Journal Papers
- Chae, Y.; Cingiser Dipippo, L.; Sun, Y.L., "Trust Management for Defending On-off Attacks," *Parallel and Distributed Systems, IEEE Transactions on* , vol.PP, no.99, pp.1,1, 2014 (CITE: 34)

Conference Papers
- Y.H. Chae, N. Katenka, L. DiPippo. "An Adaptive Threshold based Trust Management Scheme for Intrusion Detection Systems", on IEEE International Symposium on Network Computing and Application, 2018 (Under Review)
- Y.H. Chae, N. Katenka, L. DiPippo. "Adaptive Threshold Selection for Trust-based Detection Systems," on Data Mining for Cyber Security, 2017
- Chae, Younghun, Lisa Cingiser DiPippo, and Yan Lindsay Sun. "Predictability trust for Wireless Sensor Networks to provide a defense against On/off attack." *CollaborateCom.* 2012 (CITE: 7)

- Y.H. Chae, J.H. Yoon, Y.H. Yook, S.J. Moon. "A Study of Design a Mobile Platform Based on the Extended Microwindows", *2005 Korea Internet Information Society Spring Conference*, 2005.
- Y.H. Chae, S.J. Moon. "A Study of making and display font of Korean, Japanese, Chinese for Embedded System", *2006 Korea Internet Information Society Spring Conference*, 2006.

In Class Papers
- Y.H.Chae, "Secure Adaptive Routing Protocol with Certificated Authentication", *2010 CSC 512 Distributed Network*, 2010 Spring Semester, 2010.

- D.K.Mathews, Y.H.Chae. "Quantum Cryptography", *2010 CSC 438 Information and Network Security*, 2010 Spring Semester, 2010.

- Y.H.Chae. "Advanced Structure for Mobile Base Station in Wireless Sensor Networks", *2009 CSC 511 Advanced Computer Organization*, 2009 Fall Semester, 2009.

Thesis and Dissertation
- Y.H. Chae. "Representing Statistical Network-Based Anomaly Detection by Using Trust", University of Rhode Island, 2017 (CITE:1)

- Y.H. Chae. "Redeemable Reputation based Secure Routing Protocol for Wireless Sensor Networks", University of Rhode Island, 2012 (CITE:6)

SERVICE TO PROFESSION

- Peer reviewer: IEEE Transaction on Vehicular Technology
- Peer reviewer: Security and Communication Networks
- Peer reviewer: Arabian Journal for Science and Engineering
- Peer reviewer: International Conference on Sensor Networks and Signal Processing

MEMBERSHIPS

- IEEE Member   2014 - 2016

ACTIVITIES

- Korean Graduate Students Association: President   2011 - 2015